GROUND VEHICLE SYSTEMS ENGINEERING AND TECHNOLOGY SYMPOSIUM

Michigan Chapter
NDIA
National Defense Industrial Association

ESD
THE ENGINEERING SOCIETY OF DETROIT
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CALL FOR PAPERS

2010 EVENT LOCATION
Hyatt Regency Dearborn
600 Town Center Drive
Dearborn, MI 48126

MAIN SESSION
August 17-18, 2010

MINI-SYMPOSIA
August 18-19, 2010

2ND ANNUAL

GVSETS

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THE 2010 GROUND VEHICLE SYSTEMS ENGINEERING AND TECHNOLOGY SYMPOSIUM (GVSETS)

SUBMISSION DEADLINE – APRIL 16, 2010

The Michigan Chapter of the National Defense Industrial Association, in coordination with The Engineering Society of Detroit, is sponsoring the Second Annual Ground Vehicle Systems Engineering and Technology Symposium, a three-day event dedicated to the engineering and technology of military ground vehicles.

"GVSETS provides organizations that work with the military vehicle complex with access to expertise and information that will help them set program agendas and leverage R&D resources in ways that best address the tactical needs of our fighting men and women," announced Dr. Grace M. Bochenek, Director of the U.S. Army Tank Automotive Research, Development and Engineering Center (TARDEC).

The Main Session on August 17-18 will be devoted to invited speakers followed by submitted talks that will be presented in five parallel Mini-Symposia on August 18-19.

Scientists and engineers from government, academia and industry are invited to submit abstracts. The Technical Program Committee will select those submissions to be presented in the Mini-Symposia and/or to be published in the proceedings. One paper will be recognized with the Best Paper Award.

Abstracts of 200 to 300 words should be submitted no later than April 16, 2010 describing the relevance and contents of their proposed papers in support of the mission of the U.S. Army. All papers should be unclassified and releasable to the public.

The abstracts must be submitted after the authors have obtained required local disclosure authorization and security and OPSEC (Operations Security) approvals pertaining to professional conferences open to academia and industry. All papers should be unclassified and releasable to the public. Submissions imply the intent of at least one author to register for the 2010 GVSET Mini-Symposium and present the paper.

Abstracts will be submitted in one of the five areas covered by the Mini-Symposia shown below. Additional details and forms are provided in the subsequent pages.

- Modeling and Simulation, Testing and Validation (MSTV)
- Power and Energy (P&E)
- Robotic Systems
- Systems Engineering
- Vehicle Electronics and Architecture (VEA)

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MODELING AND SIMULATION, TESTING AND VALIDATION MINI-SYMPOSIUM

VEHICLE DYNAMICS AND MOBILITY
- Terrain and Soil
- Vehicle/Terrain Interface
- Tires and Tracks
- Suspension, Ride and Handling
- Rollover Mitigation
- Real-Time Dynamics

POWER AND ENERGY
- Hybrid Power Systems
- Powertrain
- Electrical and Hydraulic Systems
- Engines, Generators, Batteries, Auxiliary Power
- Power Management/Duty Cycles
- Operator/Hardware-in-the –Loop
- Fuel Economy/Efficiency
- Alternative Energy

STRUCTURES
- Vehicle Chassis/Hull
- Fasteners, Welds and Joints
- Optimization
- Space, Weight and Packaging
- Advanced Materials
- Material Properties
- Safety
- Failure Modes

HUMAN FACTORS
- Operator-in-the-Loop
- Cognition and Neuroscience
- Human Performance
- Cognitive Engineering
- Virtual Environments

THERMAL AND FLUIDS
- Underhood and Crew Cooling
- Cooling Systems
- Detailed Component Models
- Acoustics
- Thermal Management
- Equipment Cooling
- Fire Suppression

SYSTEM/MULTI-DOMAIN
- Multi-Physics
- Operational/Performance
- Embedded Software
- Logistics/Maintainability
- Operator/Hardware-in-the-Loop
- Prognostics and Diagnostics
- Multidisciplinary Optimization and Sensitivity Analysis
- Combat Modeling
- Reliability and Durability
- Advanced Concepts

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POWER AND ENERGY MINI-SYMPOSIUM

CHASSIS CONTROL
- Electronic Stability Control
- Active/Semi-Active/Power Regenerative Suspension
- Predictive Control Systems
- Other Chassis Control Systems

POWERTRAIN
- COTS Diesel Engine Optimization
- High Power Density Propulsion Systems
- Novel Transmission Technologies
- Closed Loop Control
- Multi-Fuel Capability
- Powertrain Control Strategies

THERMAL MANAGEMENT
- Improved Forced Air Cooling
- Single & Biphasic Heat Pipes
- Improved Heat Production/Rejection
- Active Thermal Management

POWER MANAGEMENT
- Control Strategies
- Approaches with Optimal Capability and Flexibility

NON-PRIMARY POWER
- Advanced Compact Engine Designs
- Compact Air Filtration
- Sound Reduction

JP-8 REFORMER/FUEL CELL APU
- Compact Sulfur Removal
- Innovative Reforming
- Fuel Cell Control

ENERGY STORAGE
- Standardization
- Batteries
- Battery Management Systems

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ROBOTIC SYSTEMS MINI-SYMPOSIUM*

PERSISTENT STARE
- Situational Awareness: real-time information to an operator
- Route Planning: navigate autonomously to a specified point
- Tactical Behaviors: move through areas of anticipated enemy threat

UNMANNED IED DETECTION AND DEFEAT
- Autonomy: vehicle moves to area of operations and follows planned route
- Human Factors: human dimension of controlling manned and unmanned assets
- Decision Aids: using intelligent agents to make or fine-tune route adjustments

ROBOTIC WINGMAN
- Autonomy: navigate autonomously with manned system and assume a role as a member of squad/formation
- Situational Awareness: provide unmanned reconnaissance, surveillance, target acquisition, scout and engagement capabilities

CONVOY LOGISTICS
- Autonomy: fully autonomous convoy in limited visibility and normal conditions with the ability to eliminate the need for a vehicle operator
- Situational Awareness: increase vehicle operator situational awareness for ambush and IED detection

Further information on these four areas is documented in
www.tardec.info/roboticsrodeo/OperationalScenarios.aspx

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MINI-SYMPOSIA
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SYSTEMS ENGINEERING MINI-SYMPOSIUM

SYSTEMS ENGINEERING FOUNDATIONS
- Requirements Definition and Allocation
- Functional Analysis and Allocation
- Architecture Synthesis and Performance
- Mission and Operations Analysis
- Integration, Verification and Validation
- Systems Analysis
  – Trade Studies, Decision Analysis
  – Human-centric Performance
- Risk Management
- Design to Cost and Technical Maturity
- Data, Model, Information Sharing
- Model-Based Development and Support to Decision-Making
- High-Throughput/Automated Development Environments

SYSTEM-OF-SYSTEMS ENGINEERING
- Net-Centric Operations
- Combat and Operational Effectiveness

APPLYING SYSTEMS ENGINEERING
- Systems Engineering for Facilitating Systems Integration
- Rapid Fielding
- Manufacturing and Support
- Scalability for Small, Medium and Large Programs
- 2009 Weapon Systems Acquisition Reform Act and Systems Engineering
- Case Studies

IMPROVING SYSTEMS ENGINEERING
- Best Practices
- Product or Process Improvement Strategies
- Management Considerations for Implementing
- Improvement for Platform, Systems of Systems, and Network Integration Challenges

GAPS, CHALLENGES AND OPPORTUNITIES IN SYSTEMS ENGINEERING AND SYSTEMS INTEGRATION

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MINI-SYMPOSIA
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VEHICLE ELECTRONICS AND ARCHITECTURE MINI-SYMPOSIUM

NETWORK AND BATTLE COMMAND
- Architecture for modular C4ISR integration into platforms
- On-the-move, secure Communications
  - Efficient spectrum utilization
  - Cognitive networking
- Battle Command
  - Mission planning and managing UGVs
  - Applications / software services to synchronize intell and ops functions
- Sensors for Situational Awareness and Vehicle Protection
- Antenna Enhancements
  - Multifunctional; affordable; broadband
  - Embedded; conformal; low-signature

EMERGING TRENDS IN SOFTWARE/HARDWARE ARCHITECTURES FOR MILITARY GROUND VEHICLES
- Processing and input/output devices such as single-board computers and displays and controls for vehicle and dismounted applications.
- Intra-vehicle network hardware, software, and protocols for data and video distribution to include gigabit Ethernet, CAN, Flexray, etc.
- Software infrastructure components such as real-time operating systems, operating environments and middleware, and designing for safety critical systems.
- Open standards development such as Versatile Modular Euro card International Trade Association standards, AUTOSAR, etc.
- Power Architecture considerations for intelligent load switching, power management, power margining and power sequencing.

CONDITION-BASED MAINTENANCE (CBM)
- Reliability Centered Maintenance
- Data Analysis and Acquisition
- Diagnostic/Prognostic Algorithm Development
- Data Warehousing and The Enterprise

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SUBMISSION
INSTRUCTIONS
AND FORM

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SUBMISSION REQUIREMENTS

DUE BY APRIL 16, 2010

An UNCLASSIFIED abstract of 200-300 words that states the paper/presentation objective; outlines the problem requiring solution or the method of approach to research; is explicit with respect to the types of data to be included and summarizes the conclusions that will be made. Submit all abstracts via email to **gvsets@esd.org** in a PDF form.

SUBMITTED ABSTRACTS WILL BE EVALUATED BASED ON THE FOLLOWING CRITERIA:
- Relevance/importance to its respective submission category and the U.S. Army
- The effort's potential impact on improved energy efficiency for Soldiers
- Originality and importance to the scientific field or technology
- Sound scientific methodology
- Clarity and readability

SUBMITTED ABSTRACTS MUST BE FORMATTED ACCORDINGLY:
- 12-point font
- 1 inch margins
- Title in capital letters 1 inch from the top of the page
- Title followed by author(s) and their affiliations(s)
- Each line in the heading is centered
- Double space between the heading and beginning of the abstract
- Single space the abstract
- Double space between paragraphs

ABSTRACT ACCEPTANCE NOTIFICATION

DUE BY MAY 14, 2010

Authors of abstracts chosen by the review team will be notified and provided with detailed directions for the formatting of final manuscripts. A complete list of all chosen abstracts will be listed on both the NDIA website http://ndia.org and ESD website www.esd.org.

Accepted authors must submit a complete manuscript prior to the conference. Specific instructions for preparing final papers for publication in the technical proceedings will be provided by the ESD when the author notifications are released.

Authors who are selected to present papers at GVSETS will receive detailed information regarding presentation form.

For more information, please contact Leslie Smith, Senior Director of Programs at (248) 353-0735 ext. 152 or **gvsets@esd.org**.

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Title of Abstract: _____

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Company/Organization: _____

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Author Three Name: _____

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PLEASE SELECT WHICH MINI-SYMPOSIUM YOUR PAPER OR PRESENTATION IS RELATED TO:

MODELING AND SIMULATION, TESTING AND VALIDATION
- ❏ Vehicle Dynamics and Mobility
- ❏ Power and Energy
- ❏ Structures
- ❏ Human Factors
- ❏ Thermal and Fluids
- ❏ System/Multi-Domain

POWER AND ENERGY
- ❏ Chassis Control
- ❏ Powertrain
- ❏ Thermal Management
- ❏ Power Management
- ❏ Non-Primary Power
- ❏ JP-8 Reformer/Fuel Cell APU
- ❏ Energy Storage

ROBOTIC SYSTEMS
- ❏ Persistent Stare
- ❏ Unmanned IED Detection & Defeat
- ❏ Robotic Wingman
- ❏ Convoy Logistics

SYSTEMS ENGINEERING
- ❏ Systems Engineering Foundations
- ❏ System-of-Systems Systems Engineering
- ❏ Applying Systems Engineering
- ❏ Improving Systems Engineering
- ❏ Gaps, Challenges and Opportunities in Systems Engineering

VEHICLE ELECTRONICS AND ARCHITECTURE
- ❏ Network and Battle Command
- ❏ Emerging Trends
- ❏ Condition-Based Maintenance

Has this paper or presentation been exhibited at other conferences?
(if so, please explain):

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